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UNITED STATES DEPARTMENT OF AGRICULTURE  
Bureau of Animal Industry

## ANALYSES OF FEEDS FOR FARM ANIMALS

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U. S. Department of Agriculture

The analyses and digestible nutrients of the feeds listed below have been compiled by G. L. Bidwell, Food Control Division, Food and Drug Administration, and A. T. Semple, formerly of the Animal Husbandry Division, Bureau of Animal Industry, United States Department of Agriculture. The total digestible nutrients shown in the last column of the table are the sum of the digestible crude protein, crude fiber, and nitrogen-free extract, plus 2.25 times the digestible fat. In a few cases, the digestible nutrients are omitted because the coefficients of digestibility have not been determined and suitable coefficients that might be substituted are not available.

Feed	Moisture	Ash	Crude protein (X6.25)	Crude fiber (X6.25)	Nitrogen-free extract (Sugars and starches)	Ether extract (Fats)	Digestible protein	Total digestible nutrients
<u>Cereal grains</u>								
Barley .....	9.6	2.9	12.8	5.5	66.9	2.3	10.2	79.2
Buckwheat .....	12.6	2.0	10.0	8.7	64.5	2.2	—	—
Corn (ground ear) ..	15.6	1.5	8.3	6.8	64.4	3.4	4.3	70.5
Corn (shelled) .....	12.9	1.3	9.3	1.9	70.3	4.3	7.1	81.9
Feterita .....	9.1	1.7	14.2	1.4	70.7	2.9	10.8	80.2
Kafir .....	9.5	1.7	13.5	1.6	70.3	3.4	9.9	78.7
Millet (foxtail) .....	10.1	3.3	12.6	8.4	61.3	4.3	8.6	75.0
Milo .....	9.3	1.6	12.5	1.5	71.9	3.2	9.1	83.3
Oats .....	7.7	3.5	12.5	11.2	60.7	4.4	9.7	66.3
Proso (hog millet) ..	9.8	2.9	12.0	7.8	63.2	3.4	—	—
Rice (rough) .....	9.7	5.4	7.3	8.6	66.9	2.0	5.6	70.7
Rye .....	9.5	1.9	11.1	2.1	73.7	1.7	9.3	80.0
Sorghum .....	12.8	2.1	9.1	2.6	69.8	3.6	5.1	70.6
Speltz (summer) .....	8.8	3.8	10.8	10.1	64.1	2.4	8.7	75.9
Wheat .....	10.6	1.8	12.3	2.4	71.1	1.8	9.8	73.1
<u>Cereal products</u>								
Buckwheat middlings:	11.5	4.5	27.5	4.2	45.3	7.0	24.2	77.4
Brewers' dried grains .....	6.8	3.6	26.9	14.3	41.4	7.0	21.8	66.4
Corn bran .....	10.3	2.4	9.9	10.4	59.7	7.3	5.2	72.8
Corn feed meal .....	10.8	1.5	8.8	2.3	72.7	3.9	6.7	83.2
Corn germ meal .....	7.0	3.8	20.8	7.3	51.5	9.6	15.2	80.6
Corn gluten feed ..	9.2	3.6	25.1	7.3	51.9	2.9	21.3	79.5
Corn gluten meal ..	9.0	1.3	40.9	3.2	44.5	1.1	35.6	76.9
Distillers' dried corn grains .....	6.9	2.5	31.0	11.2	36.3	12.1	22.6	88.5
Distillers' dried rye grains .....	7.5	2.8	24.4	10.9	44.1	10.3	12.4	56.6
Elevator dust .....	7.5	18.3	10.6	15.0	45.3	3.3	7.1	46.8
Hominy feed .....	8.3	2.9	10.9	4.6	65.6	7.7	7.4	85.1
Malt .....	7.7	2.9	12.4	6.0	68.9	2.1	—	—
Malt sprouts .....	7.8	5.7	25.9	12.4	46.9	1.3	19.7	74.4

Feed	Mois- ture	Ash	Crude protein (NX6.25)	Crude fiber	Nitrogen- free extract (Sugars and starches)	Ether extract (Fats)	Diges- tible protein	Total dige- stible nutrients
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Cereal products (continued)

	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Oat clips .....	9.0	9.3	11.8	22.7	42.7	4.5	4.7	51.4
Oat hulls .....	7.2	7.1	2.6	34.5	48.0	0.6	0.7	40.9
Oatmeal mill byproducts .....	6.9	6.4	6.5	26.0	52.3	1.9	3.9	38.3
Red-dog flour .....	10.1	2.9	17.2	3.1	61.9	4.8	13.6	71.2
Rice bran .....	9.6	10.0	13.8	11.3	40.5	14.8	9.2	70.5
Rice polish .....	9.4	5.0	12.1	2.1	61.7	9.7	8.2	84.1
Rye feed .....	10.2	4.0	15.6	4.3	62.7	3.2	10.0	65.0
Rye middlings .....	9.5	4.4	16.7	5.5	60.2	3.7	10.7	64.8
Rye middlings and screenings .....	9.1	4.9	16.2	6.5	59.6	3.7	10.4	64.2
Screenings (wheat) ..	8.0	6.4	15.0	9.7	57.1	3.8	10.5	62.4
Vinegar grains .....	6.8	2.9	19.5	17.3	46.5	7.0	12.5	62.3
Wheat bran .....	9.6	5.9	16.2	8.5	55.6	4.2	12.3	61.4
Wheat bran and screenings .....	9.1	6.4	15.9	9.0	55.5	4.1	12.1	61.1
Wheat middlings or shorts .....	10.1	3.5	16.3	4.3	61.6	4.2	13.7	79.0
Wheat middlings and screenings ...	9.4	4.9	16.9	6.1	58.0	4.7	14.2	77.9
Wheat mixed feed ...	9.7	5.0	16.2	6.7	58.1	4.3	12.5	57.0
Wheat mixed feed and screenings ...	9.8	5.4	16.3	6.6	57.7	4.2	12.6	56.7

Cereal and sorghum hay, stover, and fodder

Barley hay .....	10.6	5.3	9.3	23.6	48.7	2.5	6.0	53.7
Corn cobs .....	10.7	1.4	2.4	30.1	54.9	0.5	0.2	43.9
Corn fodder .....	11.8	5.8	7.4	23.0	49.6	2.4	4.1	59.7
Corn husks .....	9.8	2.9	2.9	30.7	53.0	0.7	0.6	59.9
Corn leaves .....	11.8	8.5	8.1	24.4	45.0	2.2	3.2	51.5
Corn stalks .....	11.7	4.6	4.8	32.7	44.4	1.8		
Corn stover .....	10.7	6.1	5.7	30.3	45.7	1.5	2.3	51.0
Kafir fodder .....	9.1	7.8	6.6	28.4	46.0	2.1	3.4	54.3
Hungarian millet (foxtail) .....	10.0	7.9	8.9	27.1	43.4	2.7	5.3	56.7
Oat hay .....	11.0	6.8	7.9	29.6	41.9	2.8	4.2	46.0
Pearl millet (cattail) .....	10.1	9.7	9.0	32.3	37.1	1.8	5.7	50.7
Rye hay .....	6.4	4.7	5.9	37.4	43.6	2.0	—	—
Sorghum hay .....	5.8	9.5	9.5	26.8	46.5	1.9	2.9	48.9



Feed	Mois- ture	Ash	Crude protein (NX6.25)	Crude fiber	Nitrogen- free extract (Sugars and starches)	Ether extract (Fats)	Diges- tible protein	Total diges- tible nutrients
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Cereal and legume straw

Percent: Percent: Percent: Percent: Percent: Percent: Percent: Percent: Percent

Barley .....	14.2	5.7	3.5	36.0	39.1	1.5	0.7	43.3
Buckwheat .....	9.9	5.5	5.2	43.0	35.1	1.3	—	—
Cowpea .....	9.7	5.3	7.4	41.5	34.8	1.3	—	—
Flax .....	6.2	3.8	7.8	46.9	33.1	2.1	6.3	37.1
Oat .....	9.2	5.1	4.0	37.0	42.4	2.3	0.6	46.9
Rice .....	8.9	13.5	4.5	34.0	37.5	1.6	1.0	39.1
Rye .....	7.1	3.2	3.0	38.9	46.6	1.2	0.6	42.0
Soybean .....	8.7	7.4	5.7	34.6	41.1	2.5	1.3	37.6
Sweetclover .....	5.1	3.4	6.7	49.6	34.0	1.2	:	:
Wheat .....	9.6	4.2	3.4	38.1	43.4	1.3	0.4	37.6

Grass hay

Bermuda grass .....	8.9	7.9	7.2	24.9	49.4	1.7	3.7	44.3
Black grama .....	5.5	7.0	4.3	31.4	50.5	1.3	—	—
Bluegrass .....	11.9	7.0	9.3	27.9	40.4	3.4	5.5	52.0
Bluejoint .....	7.5	6.9	6.7	34.2	41.7	3.0	4.2	42.7
Bromegrass .....	8.3	7.5	8.9	28.1	45.3	1.9	4.9	52.8
Crabgrass .....	9.0	7.9	6.5	32.1	42.3	2.2	1.9	46.5
Italian ryegrass ..	8.5	6.9	7.5	30.5	44.9	1.7	2.6	46.7
Johnson grass .....	9.0	7.0	8.2	29.7	43.4	2.7	3.6	50.7
Meadow fescue .....	11.6	7.0	6.6	31.6	41.2	2.0	3.4	51.3
Orchard grass .....	9.9	6.0	8.1	32.4	41.0	2.6	4.9	50.3
Perennial ryegrass	9.5	9.7	11.1	26.8	51.6	4.0	6.1	57.9
Prairie hay	:	:	:	:	:	:	:	:
(Colo., Wyo.)....	5.5	7.2	7.0	31.3	46.6	2.4	4.4	58.2
Prairie hay	:	:	:	:	:	:	:	:
(Kans., Okla.)....	9.5	7.5	4.4	30.4	45.9	2.3	2.8	55.3
Prairie hay	:	:	:	:	:	:	:	:
(Minn., S. Dak.)..	11.6	7.2	6.0	30.3	42.5	2.4	3.8	54.2
Red top .....	8.9	5.2	7.9	28.6	47.5	1.9	4.8	53.9
Rhodes grass .....	8.6	8.4	5.3	33.4	43.1	1.2	2.4	53.0
Sedge	:	:	:	:	:	:	:	:
(western species):	5.4	6.7	11.6	27.4	46.5	2.4	7.1	58.0
Slender wheatgrass	7.5	6.6	7.8	30.8	45.2	2.1	4.8	50.1
Sudan grass .....	5.3	8.1	9.7	27.9	47.3	1.7	5.0	50.5
Tall oat grass .....	8.1	6.4	9.4	29.8	43.6	2.7	4.0	46.1
Timothy (full bloom)	15.0	4.5	6.0	29.6	41.9	3.0	3.4	49.9
Timothy	:	:	:	:	:	:	:	:
(nearly ripe)....	14.1	3.9	5.0	31.1	43.7	2.2	2.1	44.8
Western wheatgrass	6.4	7.3	7.4	33.7	42.8	2.4	4.7	56.8

Feed	Mois- ture	Ash	Crude protein: (NX6.25):	Crude fiber	Nitrogen- free extract (Sugars and starches):	Ether extract (Fats)	Diges- tible protein:	Total dige- stible nutrients
<u>Oil-bearing and legume seeds</u>								
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Cottonseed .....	9.1	4.0	19.6	18.9	28.3	20.1	13.3	81.0
Cowpeas .....	9.8	3.6	23.8	4.3	57.1	1.4	19.5	77.7
Mesquite beans (pods on).....	6.6	4.5	13.0	22.8	50.4	2.7	9.1	71.7
Peanut kernels .....	5.5	2.3	30.2	2.8	11.6	47.6	26.9	139.4
Peanuts (shells on):	6.0	2.8	24.7	18.0	15.4	33.1	20.0	97.4
Soybeans .....	6.4	4.8	39.1	5.2	25.8	18.7	34.8	92.5
Sunflower .....	6.2	4.2	15.9	23.6	21.1	24.0	---	---
Velvetbeans (pods on).....	9.2	4.8	17.6	14.3	49.7	4.4	13.2	76.0
Velvetbeans .....	9.8	3.1	26.2	6.0	50.1	4.8	19.6	77.5
<u>Meals, cakes, and feeds from oil-bearing and legume seeds</u>								
Cocunut meal (old process).....	7.3	5.5	21.3	9.4	46.5	10.0	18.5	86.9
Cocunut meal (new process).....	8.9	6.6	21.4	13.3	47.4	2.4	18.6	73.0
Cottonseed meal (cold pressed)....	6.9	4.2	27.5	24.2	30.2	7.0	22.0	70.5
Cottonseed meal (choice).....	7.1	5.7	41.7	10.0	28.4	7.1	35.0	75.7
Cottonseed meal (prime).....	6.9	5.9	38.8	12.2	29.4	6.8	32.6	74.2
Cottonseed meal (good).....	7.3	5.8	36.8	13.5	30.0	6.6	30.9	73.0
Cottonseed feed ...	8.3	4.8	32.1	15.3	33.1	6.4	27.0	71.7
Cottonseed hulls ...	8.7	2.6	3.5	46.2	38.0	1.0	0.3	44.9
Linseed meal (old process).....	8.9	5.4	34.5	7.7	36.7	6.8	29.0	77.7
Peanut meal (without hulls)...	6.2	4.9	49.3	6.3	22.5	10.8	43.9	88.2
Peanut meal (whole pressed)...	7.8	4.7	35.3	21.4	21.8	9.0	28.6	57.5
Peanut shells .....	7.7	4.3	6.9	60.1	19.7	1.3	3.6	26.9
Soybean meal .....	6.1	5.6	47.1	5.7	27.7	7.8	40.0	86.0
Velvetbean pods with a few stems :	9.4	4.9	4.9	29.0	51.1	0.7	3.6	63.4
<u>Legume hays and browse</u>								
Alfalfa .....	8.3	8.9	16.0	27.1	37.1	2.6	11.5	53.5
Alfalfa leaves .....	5.8	14.2	22.5	13.2	41.1	3.2	---	---
Alsike clover .....	10.5	8.8	14.4	24.7	39.1	2.5	9.5	53.4
Australian salt bush:	6.7	16.9	16.1	21.5	37.0	1.8	13.7	44.1
Bur-clover .....	8.7	12.3	15.7	25.5	26.4	3.0	12.7	55.8
Cowpea .....	9.7	12.9	17.5	20.5	36.6	2.8	11.9	48.9
Crimson clover .....	9.6	8.6	15.2	27.2	36.6	2.8	10.5	49.8
Field pea .....	10.6	8.3	16.1	24.8	37.5	2.7	---	---



Feed	Mois- ture	Ash	Crude protein (NX6.25)	Crude fiber	Nitrogen- free extract (Sugars and starches)	Ether extract (Fats)	Diges- tible protein	Total dige- stible nutrients
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Legume hays and browse (continued)

	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Lespedeza .....	7.9	6.2	11.9	28.5	42.7	2.8	---	---
Mammoth red clover..	12.2	7.5	12.8	27.1	37.1	3.3	7.7	50.4
Peanut hay	:	:	:	:	:	:	:	:
(with nuts).....	8.0	6.7	12.7	24.9	37.5	10.2	9.7	68.2
Peanut hay	:	:	:	:	:	:	:	:
(without nuts).....	9.5	9.3	9.9	23.9	43.6	3.8	6.4	57.0
Red clover .....	12.9	6.9	13.6	24.1	39.1	3.4	8.2	50.8
Sweetclover .....	8.1	7.5	16.2	25.9	39.5	2.8	12.1	51.3
Soybean .....	8.4	8.9	15.8	24.3	38.8	3.8	10.9	51.7
Vetch (hairy).....	13.1	8.4	20.9	24.2	30.7	2.7	14.6	51.1
White clover .....	7.2	9.4	15.6	22.7	42.8	2.2	11.4	57.3

Packing-house and animal products

Blood meal .....	14.4	4.7	78.4	0.8	1.1	0.6	65.9	68.3
Bonemeal .....	7.2	61.5	23.1	3.3	---	4.9	---	---
Fishmeal and scrap :	6.8	18.5	59.3	0.6	2.6	12.2	50.4	79.9
Meat scrap .....	7.1	21.1	53.9	2.2	5.0	10.7	50.1	79.1
Tankage .....	7.6	22.2	53.7	1.8	3.8	10.9	32.2	56.4

Milk and its products

Whole milk .....	87.1	0.7	3.6	---	4.9	3.7	3.3	16.1
Skimmilk by setting :	90.4	0.7	3.3	---	4.7	0.9	3.0	9.5
Skim milk from	:	:	:	:	:	:	:	:
separator .....	90.6	0.7	3.2	---	5.2	0.3	3.0	8.6
Buttermilk .....	91.0	0.7	3.0	---	4.8	0.5	2.8	8.5
Whey .....	93.8	0.4	0.6	---	5.1	0.1	0.6	5.9

Green forage (legumes not included)

Cabbage .....	90.5	0.9	2.4	1.2	4.7	0.3	---	---
Corn fodder:	:	:	:	:	:	:	:	:
Dent (immature)...	79.0	1.2	1.7	5.6	12.0	0.5	1.1	14.0
Dent (mature).....	73.4	1.5	2.0	6.7	15.5	0.9	1.1	17.7
Flint (immature)...	79.8	1.1	2.0	4.3	12.1	0.7	1.3	13.8
Flint (mature)....	77.1	1.1	2.1	4.3	14.6	0.8	1.1	15.9
Foxtail millet .....	71.1	1.7	3.1	9.2	14.2	0.7	2.0	19.4
Italian ryegrass ..	73.0	2.5	3.1	6.8	13.3	1.3	1.7	18.8
Kafir .....	73.0	2.0	2.3	6.9	15.1	0.7	---	---
Kentucky bluegrass :	65.1	2.8	4.1	9.1	17.6	1.3	---	---
Meadow fescue .....	69.9	1.8	2.4	10.8	14.3	0.8	1.2	15.6
Oats .....	62.2	2.5	3.4	11.2	19.3	1.4	2.4	22.7
Oats and peas .....	77.8	1.9	3.3	6.2	9.8	1.0	2.5	14.8
Orchard grass .....	73.0	2.0	2.6	8.2	13.3	0.9	1.5	13.9
Prickly pear .....	78.9	4.3	0.7	2.6	13.1	0.4	0.1	12.4
Rape .....	85.7	2.0	2.4	2.2	7.1	0.6	2.1	11.2
Red top .....	65.3	2.3	2.8	11.0	17.7	0.9	1.4	18.0
Rye .....	76.6	1.8	2.6	11.6	6.8	0.6	2.1	17.2
Sorgo .....	77.3	1.3	1.5	6.2	12.6	1.0	0.5	14.5
Sweet corn .....	79.1	1.3	1.9	4.4	12.8	0.5	1.2	14.5
Tall oatgrass.....	69.5	2.0	2.4	9.4	15.8	0.9	1.1	15.7
Timothy .....	61.6	2.1	3.1	11.8	20.2	1.2	1.5	20.3

Feed	Moisture	Ash	Crude protein (Nx6.25)	Crude fiber	Nitrogen-free extract (Sugars and starches)	Ether extract (Fats)	Digestible protein	Total digestible nutrients
<u>Green legumes</u>								
Alfalfa	72.9	2.6	4.7	8.0	11.0	0.8	3.5	15.5
Alsike clover in bloom	74.8	2.0	3.9	7.4	11.0	0.9	—	—
Cowpeas	82.5	2.5	3.4	4.0	7.1	0.5	2.6	11.4
Crimson clover	80.9	1.7	3.1	5.2	8.4	0.7	2.4	12.6
Red clover	70.8	2.1	4.4	8.1	13.5	1.1	2.9	19.4
Soybeans	75.1	2.6	4.0	6.7	10.6	1.0	3.1	15.3
Sweetclover	77.2	1.9	4.0	6.4	9.8	0.7	3.1	14.4
<u>Roots, tubers, and fruits</u>								
Artichokes	78.0	1.8	2.4	0.9	16.8	0.1	—	—
Carrots	88.6	1.0	1.1	1.3	7.6	0.4	0.8	9.6
Mangels	91.2	1.0	1.4	0.8	5.4	0.2	1.1	7.1
Potatoes	78.9	1.0	2.1	0.6	16.3	0.1	1.3	17.6
Pumpkins	88.2	0.9	1.6	1.8	6.1	1.4	1.2	10.5
Rutabagas	88.6	1.2	1.2	1.3	7.5	0.2	1.0	9.4
Sugar beets	78.0	1.0	1.5	2.9	16.5	0.1	0.9	19.2
Sweetpotatoes	71.1	1.0	1.5	1.3	24.7	0.4	0.9	25.1
Turnips	90.6	0.8	1.3	1.2	5.9	0.2	1.1	8.2
<u>Silage</u>								
Corn (immature)	79.1	1.4	1.7	6.0	11.0	0.8	0.9	13.5
Corn (mature)	70.9	1.4	3.4	6.9	17.5	0.9	1.4	20.0
Corn stover	80.7	1.8	1.8	5.6	9.5	0.6	0.7	10.6
Cowpea	77.8	2.1	3.2	6.5	9.5	0.9	1.1	10.3
Oats and peas	73.7	2.1	3.3	8.9	10.8	1.2	2.5	17.2
Red clover	72.0	2.6	4.2	8.4	11.6	1.2	2.1	15.2
Sorgo	77.6	1.7	1.5	7.1	11.0	1.1	0.2	13.0
Soybean	72.1	3.5	4.1	8.3	10.5	1.5	2.5	15.3
Sweetclover	68.7	2.4	3.2	13.0	11.9	0.8	—	—
Sunflower	77.9	2.1	1.8	6.5	10.1	1.6	0.9	13.3
<u>Miscellaneous byproducts</u>								
Apple pomace	78.6	0.6	1.3	3.7	14.6	1.2	0.1	14.9
Sugar-beet molasses	20.8	10.6	9.1	—	59.5	—	2.8	59.3
Cocoa shells	4.9	10.4	15.1	16.5	50.3	2.8	1.7	53.0
Dried beet pulp	8.4	3.5	9.3	18.7	59.3	0.8	4.6	70.4
Dried molasses	—	—	—	—	—	—	—	—
beet pulp	8.0	5.7	9.6	16.0	60.3	0.4	4.7	72.3
Palm midds 1/	6.3	5.2	16.2	7.7	56.7	7.9	13.1	77.5
Sugar-beet pulp	90.5	0.4	0.9	2.2	5.8	0.2	0.6	7.4
Sugarcane molasses	24.0	6.8	3.1	—	66.1	—	1.0	63.8

1/ Wheat middlings used to absorb palm oil on tin plate in the manufacturing process.